GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00060051		
Field of study	Environmental Engineering		
Date of commencement of studies	February 2023	Academic year of realisation of subject	2023/2024
Education level	second-cycle studies	Subject group	Obligatory subject group in the field of study Subject group related to scientific research in the field of study
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	2	Language of instruction	Polish
Semester of study	3	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Sanitary Engineering -> Faculty of Civil and Environmental Engineering		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Jacek Mąkinia	
	Teachers	prof. dr hab. inż. Jacek Mąkinia	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	15.0	0.0	0.0	0.0	45
E-learning hours included: 0.0						

Learning activity and number of study hours

Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
Number of study hours	45	5.0	30.0	80

Subject objectives

Understanding of the principles of the circular economy, the business models used, the methods of design, policy issues and strategies supporting circular economy, as well as industry applications, including in the water and wastewater sector. The combination of theoretical knowledge, practical examples and group project aims to equip students with the knowledge and skills needed during the transition towards a more sustainable and circular economy.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K7_U11	When formulating and solving design or research tasks, the student is able to integrate knowledge in the field of environmental engineering, using a systemic approach, taking into account aspects of the circular economy.	[SU5] Assessment of ability to present the results of task [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment
[K7_W08] has knowledge necessary to understand the social, economic, legal and other non-technical determinants of engineering activities and their incorporation in engineering practice	The student has the knowledge necessary to understand the social, economic and legal conditions of the concept of the circular economy and its implementation in engineering practice.	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge
K7_W07	The student has in-depth, structured, theoretically based knowledge of the circular economy and its applications in the water and wastewater sector.	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge

Subject contents	Definition and principles of the circular economy (CE). Key concepts in CE (3R, "cradle to cradle", "cradle to grave"). Business models (regeneration, sharing, optimization, looping, exchange). Design principles (Eco-design and sustainable materials, dismantling and recycling, biomimicry in product design). Policy and regulation (international and national policies supporting the CE, regulatory frameworks and standards). Measures and assessment of CE (measurement of circularity, efficiency indicators, assessment of environmental and economic impact. Challenges and opportunities. CE in various industries, including the water and wastewater sector and waste management.Exercises:- Product/service in the idea of circular economy in selected economic sectors (inspirations, case study, assumed environmental benefits)- Housing project in the idea of CE (inspirations, case study, expected environmental benefits)
Prerequisites and co-requisites	

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
	50.0%	30.0%
	50.0%	70.0%

Recommended reading

Basic literature	Weetham, C. (2020). Circular Economy Handbook. Kogan Page. ISBN: 1789665310
Supplementary literature	Carlos Andrade,Sandrine Selosse,Nadia Maïzi. Thirty years since the circular economy concept emerged: has it reached a consensus. [Research Report] Working Paper 2021-02-30.Julian Kirchherr, Nan-Hua Nadja Yang, Frederik Schulze-Spüntrup, Maarten J. Heerink, Kris Hartley,Conceptualizing the Circular Economy (Revisited): An Analysis of 221 Definitions,Resources, Conservation and Recycling, 194, 2023, 107001, ISSN 0921-3449, https://doi.org/10.1016/j.resconrec.2023.107001.
eResources addresses	Podstawowe http://gozwpraktyce.pl - https://www.ellenmacarthurfoundation.org/ - Adresy na platformie eNauczanie: Gospodarka o obiegu zamknietym - Moodle ID: 37110 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=37110

Example issues/ example questions/ tasks being completed	
Work placement	Not applicable